

Newsletter

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Director's Note

There is growing concern that a majority of young people are not making the connections to the out-of-doors that so many of us did as children. Among the reasons for this may be parental concerns about safety as well as the technology that lures people of all ages to computer and television screens. The consequences are as yet unknown. But experiences out-of-doors, whether play or more structured activities, help to nurture concern for nature. To sustain healthy ecosystems in the future, we will need a human population with that kind of concern and, more than that, with expertise about the functioning of ecosystems.

Ecology education is an integral part of the Institute's mission. In this issue of the newsletter you will read of three current programs, one that excites the youngest students about the wonders and mysteries of nature, and the other two that help to draw college students into the field of ecology.

The IES Newsletter is published by the Institute of Ecosystem Studies, located at the Mary Flagler Cary Arboretum in Millbrook, New York.

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Where Do I Go from Here?

How might our lives have been different if, as students, we'd had the chance to open the blinds on a dozen different windows to the future, to see the challenges and opportunities that lay ahead, and to use those visions to help us decide which path we wanted to follow?

At the Institute of Ecosystem Studies, Research Experiences for Undergraduates (REU) students as well as students from nearby colleges and universities look through those windows to the future at the annual "Forum on Opportunities in Ecology". The day-long forum is scheduled typically for the midway point of the REU experience (see box, page 3). During the morning session, in succinct presentations liberally laced with humor, twelve professionals explain how they got to the job they're in and address questions like "What excites me about my job?" and "What does a typical day or week look like?" In the afternoon, students rotate to panels for informal discussion.

One hundred ten students were in the IES Auditorium on the morning of July 22 to absorb the experiences and advice of this year's presenters. In addition to REU students from IES, Harvard Forest and the University of Massachusetts, Boston, there were groups from Columbia, Fordham and New York universities, SUNY Purchase, Union College and Ulster County Community College, as well as individuals from a number of other institutions. IES Head of Education Dr. Alan Berkowitz welcomed students and speakers and introduced the forum's goal as a way to explore the interface between ecology and life: how does ecology contribute to each of the represented professions, and how does the profession contribute to ecology?

Mr. Jerry Sherman, for example, a ninth-grade teacher at Millbrook High School, told how he developed a course called earth systems, which integrates all the sciences and literally brought life to the existing "biology-free" earth science class. A teacher for 35 years, Mr. Sherman counted among the rewards of his profession the fact that his "synapses are still increasing" — that he is always learning — and the awareness that by providing his students with a system-wide view of the world he is making a difference not only in their lives but also in the lives of their families. At the other end of the educational spectrum was Ms. Felicia Keesing, a doctoral candidate at the University of California at Berkeley who was chosen to represent the area of "research abroad". Ms. Keesing, an ecologist who studies small mammals, did her thesis research on interactions among hoofed mammals, small mammals and vegetation in Kenya. Challenges included keeping a 1972 Land Rover running so she could travel to her field sites; rewards came from working with animals like the pouch mouse that people knew little to nothing about, and with the discovery of previously unknown ecological connections between ungulates and small mammals.

Mr. Shabazz Jackson is the Director of Greenway Marketing in Beacon, N.Y. He told how, after graduating from high school, he did a considerable amount of traveling during which he saw the impact of wasted resources. Upon his return he went into the resource recovery business, designing a system that recovers 70% of Beacon's wastes. Dr. Louis Sorkin represented the career opportunities presented by museums. Specializing in entomology and arachnology at the American

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During the afternoon session of the Forum on Opportunities in Ecology, REU students asked doctoral degree candidate Felicia Keesing, center, about the logistics of doing field work abroad.

SEEDS for Growth in Diversity

Imagine a world without diversity. Only blue jays at the feeder. Only oak trees in the forest. Only Muzak on the radio. The word "dull" wouldn't begin to describe it.

Diversity makes life interesting, and, more than that, it ensures survival and growth. Biological diversity sustains a healthy ecosystem: a broad gene pool enables a species to adapt to changes in its environment, and a diversity of species supports the network of interactions that holds ecosystems together.

Diversity creates a richer human environment as well. Varied life experiences, grown from different ethnic, cultural and geographical backgrounds, contribute to a healthy exchange of ideas and skills in the community, in business, in government ... and in science.

Identifying, understanding and solving environmental problems — all of which have strong social and economic components — increasingly demands the diverse perspectives of a broad sector of society. Unfortunately, not only are certain groups under represented in environmental fields, but their communities often are disproportionately affected by environmental degradation. Are we missing or improperly framing problems because of the homogenous nature of the ecology work force?

In an effort to address this question, the Ecological Society of America (ESA) and The College Fund/UNCF (formerly the United Negro College Fund, an organization that provides educational opportunities and programs for students attending historically black colleges and universities in the United States) formed a partnership aimed at increasing the number of minority students majoring in ecology in college. Dr. Alan Berkowitz and Mr. Dan Durett*, representatives from the two organizations, started a program called Strategies for Ecology Education,

** Dr. Berkowitz is the Head of Education, Institute of Ecosystem Studies, and Vice President for Education and Human Resources, Ecological Society of America; Mr. Durett is Director of the Department of Environmental Education Programs at The College Fund/UNCF.*



Ecology Recruitment Program Coordinator Stephanie Shoemaker met with Dr. Charles Nilon at IES in July to plan for the SEEDS Workshop in Albuquerque. Dr. Nilon, Associate Professor of Wildlife Management at the University of Missouri-Columbia, serves on the ESA's Gender and Minority Affairs Committee and is participating in a SEEDS Mentor Program.

Development and Sustainability, or SEEDS, funded by a grant from The Andrew W. Mellon Foundation. The Mellon Foundation, through its Minority Undergraduate Fellowship Program, has provided financial support for Research Experiences for Undergraduates students at IES and three other sites since 1994. The ESA portion of the project is coordinated by Ms. Stephanie Shoemaker, working at IES, and Ms. Susan Veres coordinates The College Fund/UNCF portion.

SEEDS addresses a key barrier to minority recruitment: students' lack of awareness of ecology as a course of study and a career. UNCF institutions interested in participating in SEEDS submitted proposals detailing how they would recruit freshmen and sophomores into ecology, develop innovative ecology courses and increase career awareness, and five were selected to share the Mellon Foundation grant. Each of those five schools created an Ecology Recruitment Team comprising faculty members, students and Ecological Society of America ecologists, which Ms. Shoemaker matched with each site based on the scientist's location and field of expertise. For example, St. Augustine's College in Raleigh, North Carolina, which proposed an outdoor ecology laboratory, has been paired with Dr. Boyd R. Strain, a plant ecologist at Duke University, and Dr. Martin H. Posey, an aquatic ecologist at the University of North Carolina, Wilmington. Another participant is Wiley College in Marshall, Texas. Its ESA

partners, Dr. Thomas Arsuffi (who coincidentally was a 1986 IES Cary Summer Fellow), an ecologist at the Aquatic Station, Southwest Texas University, and Dr. Paula Williamson, also of Southwest Texas University, will be helping to develop new ecology courses including one called Environmental Biology: Biology of Wetlands and Aquatic Organisms.

Clafin College in Orangeburg, South Carolina, Dillard University in New Orleans, Louisiana and Tuskegee University in Tuskegee, Alabama are the other SEEDS participants. The five colleges are develop-

ing a number of ideas for boosting undergraduate exposure to ecology, including scheduling special guest speakers, adding field trips to the course syllabi, addressing issues of local concern and creating websites. The recycling program initiated by the Wiley College recruitment team has increased environmental awareness school-wide, and at least one university has started an on-campus environmental organization.

Seventeen SEEDS students, ten faculty and seven ESA partners are attending the annual meeting of the Ecological Society of America in Albuquerque this August. At a SEEDS Workshop following the meeting they will present their Ecology Recruitment Plans for the 1997-98 academic year and exchange ideas for recruitment and curriculum development. One objective is to ensure sustainability of the programs and the partnerships, so that recruitment at all campuses is ongoing.

SEEDS has helped all its partners grow. For The College Fund/UNCF schools, the program has increased ecological awareness among faculty and students and has drawn them into the Ecological Society of America, an organization that promotes ecological research and emphasizes the importance and relevance of ecological education. And the ESA has become richer by tapping into the perspectives and talents of students and professors at UNCF institutions.

MOLLY AHEARN

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Museum of Natural History in New York City, he described how a childhood fascination with insects led to his 20-years at the museum. Now, as word of his expertise spreads, he often works with the police in matters of forensic entomology and consults on the ecology of insect infestations in buildings.

The speakers also offered career tips. Ms. Barbara Murphy, an environmental educator at Scenic Hudson in Poughkeepsie, N.Y., emphasized the

importance of good writing, grammar and communication skills. In her position as an environmental activist, these qualities are necessary to persuade people to come around to her organization's way of thinking. Ms. Elizabeth Farnsworth, a stewardship ecologist with The Nature Conservancy, advised, "Follow your heart before settling on one goal." And, in one of the afternoon panel discussions, a student asked Mr. David Stern, Supervisor of the Pathogen Program at the Department of Environmental Protection in

Valhalla, N.Y., what was the most important quality to be successful in a career. Mr. Stern's reply: a sense of humor.

The fields of academia, industry, law, consulting and science journalism were equally well represented at the forum. By the end of the day, the students had a better feel for the diversity of careers in ecological fields. Beyond that, they had glimpsed "ecology in context" — the theme of the IES REU program — from a front row seat.



Among the speakers at the Forum were, l to r: Thomas Lalley, *The Environment Show*, WAMC (science journalism); Drayton Grant (environmental law); Shabazz Jackson, *Greenway Marketing* (entrepreneur); and Jerry Sherman, *Millbrook High School* (education).

The IES REU Program

The National Science Foundation (NSF) developed the Research Experiences for Undergraduates program in the mid-1980s as a way to improve science education in the U.S. and to help assure an adequate supply of top-notch scientists, mathematicians and engineers for the future. Many institutions across the country compete for NSF funds to support REU students, and consistently the Institute of Ecosystem Studies has been among the recipients.

Funding from NSF since 1988 and The Andrew W. Mellon Foundation since 1994 allows students to do ecological research at the Institute for three months in the summer. The students collaborate with a mentor on the IES scientific staff to design their own studies, do field and/or laboratory work and analyze results. Finally, they present their findings at a symposium attended by Institute staff; members of the public also are invited to the symposium. Final reports are published as an IES Occasional Publication.

The REU experience at IES has helped to focus the lives of 93 students over the decade that the Institute has participated in the program. The ten 1997 students, their projects and mentors were:

Steven Adams (Clark Atlanta University, Atlanta, Ga.): *The quantification of forest edge structure: Exploring methods for the study of edge function.* Dr. S.T.A. Pickett, mentor.
Sarah E. Caban (Princeton University, Princeton, N.J.): *Defining the chemical environment of photobleaching.* Dr. M.L. Pace.

Polly L. Hicks (College of Wooster, Wooster, Oh.): *Edge dynamics: The influence of shrubs upon the establishment and growth of tree seedlings on a forest edge.* Dr. S.T.A. Pickett.

Heather D. Kieweg (Carleton College, Northfield, Minn.): *The effect of earthworm (*Lumbricus terrestris*) middens on denitrification rate.* Dr. P.J. Bohlen.

Melissa Moyer (Yale University, New Haven, Ct.): *The effects of the density of white-footed mice (*Peromyscus leucopus*) on the persistence of gypsy moth pupae and the resulting impact on gypsy moth population dynamics.* Dr. R. S. Ostfeld.

Robert A. Naumann (University of Michigan, Ann Arbor, Mich.): *The effects of white-footed mouse (*Peromyscus leucopus*) density upon the predation of ground-nesting bird eggs: An artificial nest study.* Drs. A.R. Berkowitz and R.S. Ostfeld.

Caroline Nielsen (Brown University, Providence, R.I.): *The effects of different freezing regimes on soil microbial processes.* Dr. P.M. Groffman

Patricia Townsend (Harvard University, Cambridge, Mass.): *Temperature, water relations and isoprene emissions in defoliated black oaks (*Quercus velutina*).* Dr. C.G. Jones
Douglas Van Hoewyk (Bates College, Lewiston, Me.): *Assessment of fens in eastern New York: Effects of disturbance on biogeochemistry.* Dr. P.M. Groffman

Joshua West (Yale University, New Haven, Ct.): *Influence of hydrologic flowpath on nitrate release from forested catchments of the Catskill Mountains, N.Y.* Dr. S.E.G. Findlay

The Institute's Research Experiences for Undergraduates program is planned and directed by Drs. Alan Berkowitz, Stuart Findlay and Steward Pickett. Ms. Patricia Atkinson is the IES REU coordinator.

IES Summer Ecology Day Camp - 1997

Ninety-six second through seventh graders were ecologists-for-a week in the fourth season of the Institute's summer ecology day camp. With educators Kris Desmarais and Laura Sanker leading the way, children were immersed in the ecology of forests, fields and wetlands.

One of the activities is a predation study. Here, Ms. Desmarais and Hillary Casson help Hannah Guernsey (center) try to figure out what kind of animal left tooth marks on the surface of a clay egg left overnight in an artificial nest.





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Calendar

CONTINUING EDUCATION

For a Fall 1997 catalogue and program information, call the Continuing Education office at 914/677-9643. Programs during September and October include:

Landscape Design

Sept. 16 (5 sessions): **Construction II**
Sept. 18 (6): **Ecological Landscape Design**
Sept. 24 (8): **Landscape Design I**
Oct. 4: **Contour Plans**
Oct. 8 (7): **Graphics I**
Oct. 18 (6): **Principles of Landscape Design**
Oct. 19: **Designing Natural Landscapes**

Gardening

Sept. 18 (5): **Plant Propagation**
Sept. 20 (6): **Plants for the Landscape**
Sept. 28: **Fall Plant Identification**
Oct. 4 (6): **Soil Science**
Oct. 30 (6): **Floriculture**

Natural Science Illustration

Sept. 15 (6): **Drawing I**
Sept. 20 (6): **Botanical Watercolor Exploration**

Biology and Earth Science

Sept. 16 (8): **Basic Botany**
Oct. 18: **Ethnobotany of North America**
Oct. 25: **Schoolyard Wildlife Habitats**

Workshops

Sept. 20: **Pond Management and Restoration**
Oct. 23: **Wetland Creation and Restoration**
Oct. 25: **Shade Gardening at Its Best**
Ecological Excursions and Garden Tours
Sept. 21: **Wetland Ecology from a Canoe**
Sept. 27: **A Walk in the Forest Canopy**
Oct. 5: **Zipfelberg Bog and Thompson Pond**
Oct. 25: **Mohonk in Autumn**

SUNDAY ECOLOGY PROGRAMS

Free public programs are held on the first or second Sunday of the month. Call 914/677-5359 to confirm the day's topic or, in case of poor weather, to learn the status of the day's program. The September and October walks are especially appropriate for families with children age five and up. Meet at 2 p.m. at the Gifford House on Route 44A for:
Sept. 7: **Stream Walk**, led by Dr. Stuart Findlay
Oct. 5: **Pond Walk**, led by Dr. Michael Pace
• We recommend that participants wear long pants tucked into socks and sturdy waterproof shoes for all outdoor programs.

IES SEMINARS

Free scientific seminars are held each Friday at 11:00 a.m. [note new time] at the IES Auditorium:
Sept. 12: **Food Webs on Islands in the Gulf of California: Influence of Predation, Marine Productivity and El Niño Events**. Dr. Gary A. Polis, Vanderbilt Univ., Tenn.

Sept. 19: **To be announced**. Speaker: Dr. Peter Attiwill, Univ. of Melbourne, Australia

Sept. 26: **Plant Niches and the Conundrum of Existence**. Dr. Jonathan W. Silvertown, Open University, Milton Keynes, U.K.

Oct. 3: **Restoration of Eelgrass, Mudflat, and Salt Marsh Habitats to Mitigate for Port of New Hampshire Expansion**. Speaker: Dr. Frederick T. Short, Univ. of New Hampshire
Oct. 10: **To be announced**.

Oct. 17: **Arthropod Diversity and Functional Importance in Temperate and Tropical Forest Canopies**. Dr. Timothy D. Schowalter, Oregon State University

Oct. 24: **Role of Benthic Microalgae in Estuarine Ecosystems**. Dr. Carolyn A. Currin, NOAA, Beaufort, N.C.

Oct. 31: **To be announced**. Speaker: Dr. Tracy L. Benning, Univ. of California at Berkeley

GREENHOUSE

The IES greenhouse, a year-round tropical plant paradise and a site for controlled environmental research, is open until 3:30 p.m. daily except public holidays. Admission is by free permit (see "HOURS").

HOURS

Summer Hours: May 1 - September 30

Closed on public holidays.

Public attractions are open Mon. - Sat., 9 a.m.-6 p.m. & Sun. 1-6 p.m., with a free permit*. The IES Ecology Shop is open Mon.- Fri., 11 a.m.-5 p.m., Sat. 9 a.m.-5 p.m. & Sun. 1-5 p.m. (The shop is closed weekdays from 1-1:30 p.m.)

* Free permits are required for visitors and are available at the IES Ecology Shop or the Education Program office daily until 5 p.m.

Winter Hours: October 1 - April 30

Public attractions and the IES Ecology Shop close at 4 p.m. and permits are available until 3 p.m.

IES ECOLOGY SHOP

New in the Shop ... photo albums ... stationery ... for children ... back-to-school folders, notepads, pens, reusable lunch bags ... and in the Plant Room ... hanging baskets
Senior Citizens Days: 10% off on Wednesdays

•• Gift Certificates are available ••

VOLUNTEER OPPORTUNITIES

For information on volunteering at IES, call Ms. Su Marcy at 914/677-5359.

MEMBERSHIP

Join the Institute of Ecosystem Studies. Benefits include subscription to the newsletter, member's rate for courses and excursions, a 10% discount on IES Ecology Shop purchases, and participation in a reciprocal admissions program. Individual membership: \$30; family membership: \$40. Call Ms. Janice Claiborne at 677-5343.

The Institute's Aldo Leopold Society
In addition to receiving the benefits listed above, members of The Aldo Leopold Society are invited guests at spring and fall IES science updates. Call Ms. Jan Mittan at 677-5343.

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